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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,856	04/14/2004	Oleg S. Fishman	1946-010US	6187
31855	7590	04/04/2006	EXAMINER	
PHILIP O. POST INDEL, INC. PO BOX 157 RANCOCAS, NJ 08073			HOANG, TU BA	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,856

Applicant(s)

FISHMAN ET AL.

Examiner

Tu Ba Hoang

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2832

Response to Arguments

Applicant's arguments with respect to claim filed January 18, 2006 have been considered but are moot in view of the new ground(s) of rejection as follow:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 10-19, and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Stenzel (US 5,109,389). Stenzel shows all features of the claimed invention including an apparatus (see Figure 4 also Figures 2 and 5) for directional solidification and melting of metallic stock or metal comprising a vessel or crucible 4 for containing a molten mass of metal or melting stock 3, a plurality of induction coils 36,37 surrounding at least the height of the exterior of the crucible 3, and means 35,42 (or 34 shown in Figure 2) for selectively applying AC current to each of the coils to inductively heat the molten mass of the metal in the crucible with *applied heat progressively decreasing from the bottom to the top* of the molten mass in the crucible whereby the ***molten mass solidifies in the crucible from the bottom to the top*** of the crucible (column 4, lines 1-41, i.e., due to the structure of the invention which permits *the lower heating zones to be operated to generate a lower inductive heating power output in comparison to the upper heating zones, the solidification zone proceeds slowly from bottom to top* of the melt and a selected solidification structure can thus be obtained), wherein means for selectively applying ac current can comprise a switching means 50,45,46,47 for each of the coils or coil turns or sub-coils with each of the switching means having switch terminals, each terminal is exclusively connected to each of the coil terminals of each coil or turn or sub-coil, a source of Ac current 34 having source terminals with at least the first source terminal connected to the switch terminals and the second source terminal connected to the coil terminals, and a control means 50 for selectively opening and closing each of the switching means to progressively decrease the induced heat from the bottom to the top of the molten mass in the vessel or crucible 3 if so desired (as shown in Figure 5), a means for selectively cooling the molten mass comprising a cooling medium 10 flowing in each of the coil and at the bottom of the crucible (i.e., at least meet the limitations of claims 5,6,19, and 24), and means or movable cooled plate 16 for pushing the solidified metal out of the crucible.

Claims 1, 3-7, 9-13, 15-19, and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuda et al (US 6,307,875). Tsuda et al shows all features of the claimed invention including a plurality of coils 5,6, each provided with switching means 7,8 and a control means 12 with feedbacks for selectively applying ac current to each of the coils, where in the molten mass 13 can be solidify from the bottom to the top of the crucible 4 as shown by element 14 and wherein the solidified metal can be push out of

Art Unit: 2832

the vessel 4 by means of a drawing device 20 shown in Figure 8. and the coil can be in the form of the cooled coil where cooling fluid can flow through such as coil 38 shown in Figure 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stenzel (US 5,109,389) in view of Fukuzawa et al (US 5,416,796) cited in the previous Office Action. Stenzel discloses substantially all features of the claimed invention as previously set forth above except for the use of a sensor means to sense the progress of solidification of the mass of the molten mass from the top of the vessel or crucible. Fukuzawa et al shows the use of a sensor means 23,24 for sensing the progress of solidification of the molten mass from the bottom to the top of the vessel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize in Stenzel the sensor means taught by Fukuzawa et al in order to sense the solidify condition of the molten such as its temperature and the surface level thickness or gauge.

Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stenzel in view of Tsuda et al (US 6,307,875) cited in the previous Office Action. Stenzel discloses substantially all features of the claimed invention except for a feedback means for adjusting the means for selectively applying ac current to each of

Art Unit: 2832

the coil to control the progress of solidification of the mass of the molten metal from the bottom to the top of the crucible. Tsuda et al show a feedback means 12 where a plurality of coils 5,6, each provided with switching means 7,8 and with feedbacks for selectively applying ac current to each of the coils, wherein the molten mass 13 can be solidify from the bottom to the top of the crucible 4. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize in Stenzel the feedback means taught by Tsuda et al in order to adjust and selectively applying ac power to the coil as well as to control the progress of solidification if so desired.

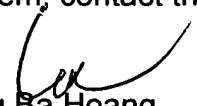
REMARK

Applicant's arguments with respect to the rejection(s) of claim(s) under 35 USC 112, second paragraph and 35 USC 102(b) over the reference to Schluckebier et al (US 5,135,781) have been fully considered and are persuasive. Therefore, such rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the new discovery reference to Stenzel as set forth above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Ba Hoang whose telephone number is (571) 272-4780. The examiner can normally be reached on Mon-Thu from 8:00AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu Ba Hoang
Primary Examiner
Art Unit 2832

March 30, 2006